# **CONT14: Preparation and Prospects**



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#### Introduction

The Continuous VLBI Campaign 2014 (CONT14) will be a continuation of the series of very successful continuous VLBI campaigns that were observed at irregular intervals since 1994. The most recent CONT campaigns were observed in roughly three-year intervals:

Campaign	Network size	Observing period	
CONT94	two 7-station networks	January 1994	
CONT95	6-station network	August 1995	
CONT96	5-station network	September/October 1996	
CONT02	8-station network	October 2002	
CONT05	11-station network	September 2005	
CONT08	11-station network	August 2008	
CONT11	14-station network	September 2011	
CONT14	17-station network	May 2014	

The planning and organization of CONT14 commenced more than a year before the actual observing date. First, the general time frame was settled by the Coordinating Center and the OPC with spring 2014 (to sample a different time of the year). Then, the actual observing dates were fixed in correspondence with the EVN and other VLBI groups to May 6–20, 2014.

## May 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22 GMVA	23 GMVA	24 GMVA
<b>25</b>	26	27	28	29	30	31
GMVA	GMVA	GMVA		EVN	EVN	EVN
					April 2014    1   2   3   4   5     6   7   8   9   10   11   12     13   14   15   16   17   18   19     20   21   22   23   24   25   26     27   28   29   30	June 2014  1 2 3 4 5 6 7  8 9 10 11 12 13 14  15 16 17 18 19 20 21  22 23 24 25 26 27 28  29 30

### **Resource Allocation**

The next step of the preparation was resource allocation. In an iterative process the station, correlator, and media resources were evaluated and then fixed. For the media it was determined that in order to not go to a lower observing rate as in the previous CONT campaigns additional media purchases were necessary.

Several stations/agencies agreed on purchasing media to support the CONT14 campaign:

Agency	Module size	Quantity	Comment
AuScope	16 TB	24	Hb, Ke, Yg
HartRAO	16 TB	12	
IAA	8 TB	10	Bd, Zc (on loan)
Matera	8 TB	10	
NASA	8 TB	20	Ft, Wf
Ny Ålesund	8 TB	10	
Onsala	8 TB	10	
USNO	8 TB	10	Kk
Wettzell	4 TB & 6 TB	6 & 4	4 * 6-TB, 6 * 4-TB
Yebes	16 TB	8	

It is estimated that 168 modules are needed to support CONT14. Most of those will be supported through new purchases and loans (124 modules). For the Hobart 26-m antenna (Ho), UTas will provide their own modules to support their participation. The remaining 36 modules will come from the media pool.

Correlation will be done at a single correlator. This will simplify the logistics and ensure consistency of results in addition to gaining experience in handling a VGOS-type load at the correlator. The Washington Correlator at USNO is planned to be the correlation facility on their new DiFX correlator. However, if this DiFX implementation will not be ready for production by the CONT14 time, the Bonn Correlator at MPIfR has agreed to take on the correlation.

### **Observing Network**

There will be 16 VLBI sites participating in the campaign. At Hobart both the 26-m and the 12-m telescopes will observe, resulting in 17 VLBI observing stations in total for CONT14.

### **Scheduling Features**

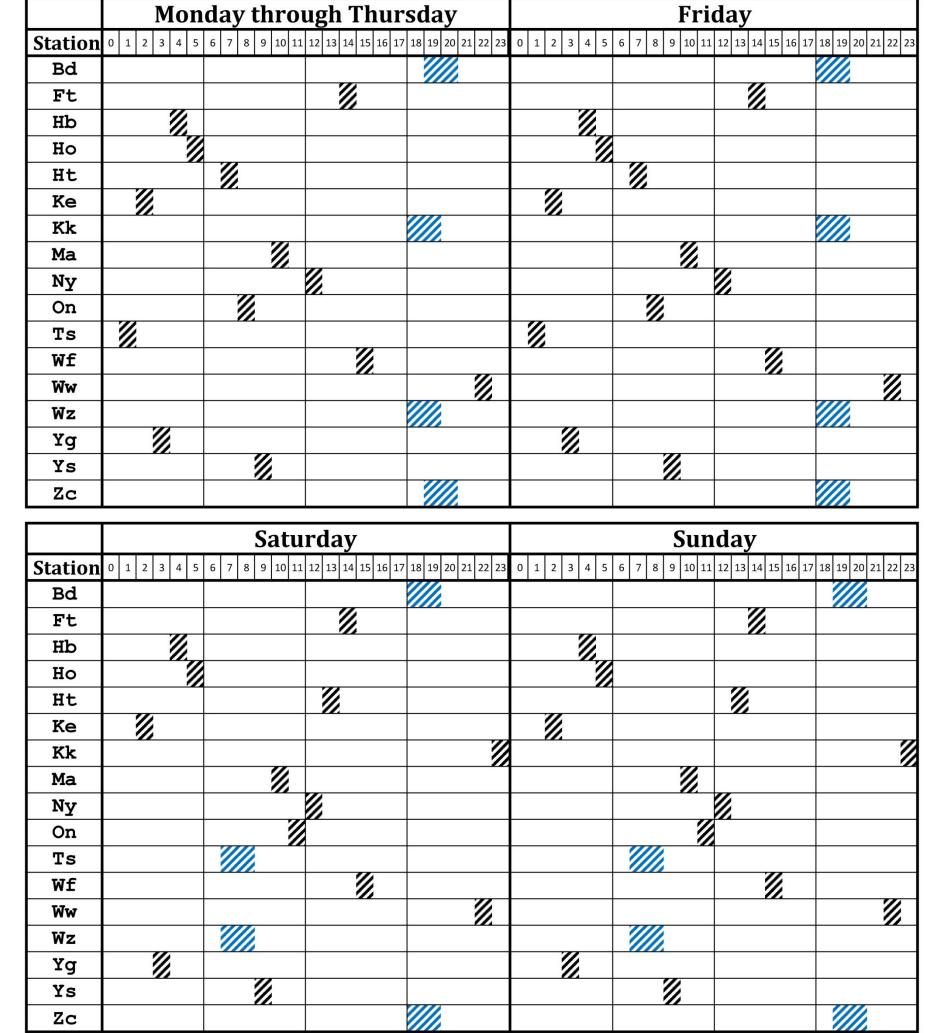
- continuous VLBI: 15 consecutive days with 3 minutes between days for schedule changes
- UT-day observing: days running from 0 UT to 24 UT



- ten northern and seven southern hemisphere stations
- reasonable global coverage with network size reaching VGOS requirements
- optimal coverage would require more stations in Africa, North America, South America as well as Southeast Asia and Oceania
- no broadband station will observe in CONT14: the processing of mixed-mode observing is not operational yet
- R&D sessions: RD1309, RD1310, RD1401, and RD1402 used to check out recording mode at all stations
- Mark 5 upgrade: rolled out to support recording of >1023 scans per module

### **Station Checks**

In order to avoid observational gaps in the overall network, station check times were determined in staggered fashion at convenient and well-coordinated times for the stations. These station check times will be used from the second to the last-but-one day of CONT14. For the case that a station can return to regular observing before the end of the station check time slot, each station is tagged along for their check period.

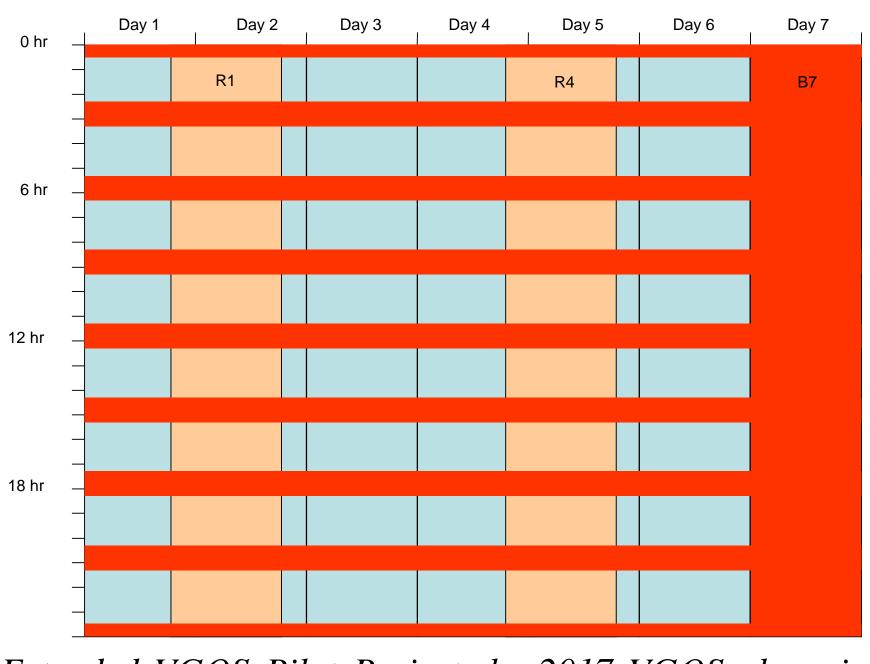


The Intensive stations (Bd, Kk, Ts, Wz, and Zc) have two-hour slots (blue). They should first run their respective Intensive sessions (Int1, Int2, or Ru-U) and then perform their checks. All other stations have one-hour check times (black).

- Data rate: 512 Mbps (same as CONT11)
- rapid turnaround sessions: the equivalents of the R1 and R4 sessions will be shipped/e-transferred and processed rapidly

## **The Future of CONT Campaigns**

With a network size of seventeen stations, CONT14 is a proper precursor of continuous VGOS-type observing but with the S/X system. Assuming 3-year gaps between future CONT campaigns, we can anticipate that by 2017 an extended VGOS pilot project with the broadband system will be in place and by 2020 continuous 24/7 VGOS observing will be fully operational.



Extended VGOS Pilot Project: by 2017 VGOS observing (in red) is anticipated to consist of one 24-hour VGOS session (B7) and six daily VGOS EOP sessions of hourly (or longer) bursts per week [Petrachenko et al., this mtg].

In 2020, the main purpose for a CONT campaign—namely continuous VLBI observing—will already be fulfilled by the standard VGOS observing. With this in mind, the following scenarios could be envisioned for future CONT campaigns:

- ➤ observe a CONT campaign with the legacy S/X system in parallel to the VGOS system;
- ➤ observe a mixed CONT campaign of legacy S/X stations and broadband VGOS stations.

It is conceivable that both types of CONT campaigns will be organized. A mixed CONT campaign could be observed in 2017 (CONT17) and a final legacy CONT in 2020 (CONT20). Further discussions are needed before a final decision can be made.

More information about CONT14 can be found at: http://ivscc.gsfc.nasa.gov/program/cont14/